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February 1991

THE PROSPECTS FOR AN INTERNATIONAL FISHERIES MANAGEMENT REGIME FOR SOUTH PACIFIC ALBACORE

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Southwest Fisheries Science Center
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CONTENTS

	Page
Introduction.	1
Description of the Resource and Fishery	2
Life History of Albacore	2
Catches of Albacore.	3
Status of the Albacore Resource.	4
International Law and High Seas Fisheries	5
1958 High Seas Fisheries Convention.	5
1982 Convention on the Law of the Sea.	6
Regional Cooperation in Fisheries Arrangements.	8
South Pacific Forum Fisheries Agency Convention.	8
Nauru Agreement.	9
Treaty on Fisheries Between Pacific Island States and the United States	10
Driftnet Fishing Convention.	11
Prospects for an International Albacore Fisheries Management Regime	12
Conclusion.	18
Citations	19

INTRODUCTION

Freedom to harvest the fishery resources of the high seas has been an accepted tenet of customary international law since the seventeenth century when the Dutch scholar Hugo Grotius suggested that no single nation should have jurisdiction over the use of the high seas for navigation or fishing. This "open-access" arrangement is satisfactory when the harvest rate is low relative to stock abundance. However, as catch and fishing effort increase, various problems may arise, including excess fleet capacity, congestion of gear, and depletion of the resource. Recognizing that an open-access regime is fundamentally inadequate for the conservation and management of fish stocks subjected to intensive harvesting, nations have attempted to devise joint arrangements to regulate their use of shared resources. Since the time of Grotius, over 250 international agreements relating to fisheries have been set forth (Redding 1986). Yet in many instances, states have been unable to agree on an effective fisheries management regime and a "tragedy of the commons" has ensued.

Negotiations are currently in progress to establish an international management regime for the South Pacific albacore, *Thunnus alalunga*, fishery. At present, no specific rules regulate the harvest of South Pacific albacore on the high seas. In recent years, catch levels in the fishery have increased dramatically, and according to some sources (e.g., Hampton 1990), the resource is in danger of being overexploited. The South Pacific is one of the world's richest fishing grounds for these highly migratory fish, which travel extensively through the high seas as well as the coastal waters of many nations. Nearly all albacore caught in the region are canned as premium-grade, white meat tuna and marketed in the United States and western Europe. With a landed value of more than $2,000 per metric ton (t), this species is one of the most highly prized tuna in the Pacific. Historically the albacore fishery has been dominated by the highly mobile fishing fleets of distant-water fishing nations (DWFNs). However, several of the island states in the region have plans to establish or expand their own albacore fishing industries.

The present paper reviews current information on the South Pacific albacore stock and examines how the possible overfishing problem evolved. To provide background for assessing the prospects for the development of an albacore fishery management regime, the international rules governing high seas fisheries are described. Examples of how these rules have been used to derive various fisheries arrangements in the South Pacific region are then presented. Finally, the potential for successfully negotiating an international agreement to conserve and manage the albacore resource of the South Pacific is discussed.

DESCRIPTION OF THE RESOURCE AND FISHERY

The distant-water fleets of Asian countries have been catching deep-swimming adult albacore in the South Pacific for more than 30 years. This fishery has been reasonably stable, with catch levels consistently in the vicinity of its estimated maximum sustainable yield (MSY). In the early 1980s, fishery scientists suggested that the South Pacific albacore yield could be increased by employing surface fishing gear that harvests juvenile albacore of the same stock. Among the countries expressing interest in developing surface fisheries were the Cook Islands, Fiji, France, French Polynesia, Tonga, New Zealand, United States, and Vanuatu (South Pacific Commission 1986).

Recognizing that additional biological and catch data were needed to assess the impact of increased surface catches on the South Pacific albacore population, representatives of national and regional fishery agencies formed the South Pacific Albacore Research (SPAR) group. This informal organization conducted workshops in 1986, 1989, and 1990 to pool existing data and identify research requirements. The information presented in this section is from the reports of the three SPAR meetings (South Pacific Commission 1986, 1989; South Pacific Forum Fisheries Agency (FFA) 1990a) unless otherwise noted.

Life History of Albacore

Albacore tuna apparently are distributed throughout the South Pacific (Fig. 1). They occur as full-size adults in deeper water in tropical and subtropical waters and as smaller, immature fish in the surface layer of the Subtropical Convergence Zone (STCZ), a band of water usually between 35° and 40°S. The northern limit of the population is thought to be 0° to 5°N while the southern edge of the STCZ appears to be its southern boundary. Juvenile albacore are found at least as far as 125°W, and longline catches of adult albacore have been reported off the coast of Chile (Wang 1988). In the western Pacific, there is no obvious discontinuity in albacore distribution from the Tasman Sea, across the southern coast of Australia, and into the Indian Ocean. Although all of the geographical boundaries of the South Pacific albacore stock have not yet been determined, this stock is considered separate from North Pacific, South Atlantic, and Indian Ocean stocks for the purposes of resource assessment.

Albacore are believed to spawn in subequatorial waters between 10° and 20°S. Juveniles migrate southward and then eastward across the central South Pacific along the STCZ during the austral summer months. The frequency and timing of the return of adult fish to tropical waters for spawning are uncertain, but tagging data suggest northerly movement occurs seasonally.

Catches of Albacore

At present, the albacore of the South Pacific are harvested by three vessel types: longliners, trollers, and drift gill-netters (Table 1). Longline vessels mainly catch large, mature fish. The trollers and drift gill-netters comprise the surface fishery and primarily harvest small, pre-spawning fish. Negligible amounts of albacore are also caught by pole-and-line and purse seine boats.

Japanese, South Korean, and Taiwanese longline vessels have been operating in the South Pacific for nearly four decades. Effort in this year-round fishery is concentrated in a band across the South Pacific between 15° and 25°S during July to October and between 30° and 40°S during January to April (Fig. 2; Wang 1988). The seasonal changes in fishing grounds reflect seasonal differences in the areas where albacore are predictably more abundant. In a given year as many as 500 longline vessels may fish for South Pacific albacore. Since 1980, the total annual catch of the longline fleet has been fairly constant, averaging about 29,000 t per year.

Until 1983, the surface albacore fishery was dominated by the New Zealand inshore trolling fleet, which harvested less than 3,000 t annually from New Zealand's coastal waters. In 1986, the U.S. troll fleet began operating in the high seas areas of the STCZ between 160° and 135°W (Fig. 3). A total of about 246 trolling vessels were participating in the surface fishery in 1989, but this figure dropped to 174 in 1990 as a result of cutbacks in the size of the New Zealand fleet. Both the U.S. and New Zealand trolling fleets operate in the region on a seasonal basis, with peak catches in January and February.

During the early 1980s, Japanese fishermen in the South Pacific experimented with large-mesh drift gillnets as a means of harvesting surface schools of albacore. They found that large quantities of albacore could be caught at a relatively low cost. In 1988, the Japanese expanded their drift gillnet fleet, and several Taiwanese drift gillnet boats entered the fishery. By the 1989 fishing season, between 125 and 195 drift gillnet vessels from Japan and Taiwan were operating in the region. However, both countries substantially reduced the size of their drift gillnet fleets in 1990 in response to strong regional and national opposition to drift gill-netting in the South Pacific. One drift gillnet boat from South Korea also participated in the fishery in 1989 but only on an experimental basis. The main fishing grounds of the drift gillnet fleet are the Tasman Sea and east of New Zealand near the STCZ (Fig. 3). The fishing seasons for drift gill-netting and trolling coincide.

In contrast to the longline fishery, the catch of the surface fishery increased dramatically between 1987 and 1989. Most of the tenfold increase was attributable to drift gill-

netting (Table 1). In 1990, the catch of the surface fishery was greatly reduced as a result of the previously mentioned decrease in the number of drift gillnet boats operating in the region.

Status of the Albacore Resource

Analyses of longline catch and effort data suggest that the MSY of the longline fishery is 30,000 to 35,000 t per year, assuming the surface fishery lands about 2,000 t. An estimated 63,000 t of albacore were harvested from the South Pacific by all gear types in 1989, double the estimated longline fishery MSY. This catch estimate does not include mortality caused by escapement or dropout from gillnets and longline or trolling hooks. The fraction of albacore entangled and killed in drift gillnets and then lost during net retrieval is estimated to be 5-10%, but industry sources indicate rates as high as 40% may occur during rough sea conditions (Wright 1989).

Many fishery scientists in the region believe that the 1989 rate of harvest is not biologically sustainable. Although the interaction between the surface and longline fisheries is not fully understood, there is concern that the rapid expansion of the surface fishery may significantly reduce the quantity of fish available to the longline fleet and threaten the long-term viability of the resource. One study (Hampton 1990) concluded that a continuation of surface fishing at the 1989 level might lead to a total collapse of the albacore population and the longline fishery within 5 years.

Japanese fishery scientists maintain that the scientific data are insufficient to support the contention that albacore are being depleted (Anonymous 1989a). Furthermore, they report that drift gill-netting is no more deleterious to the conservation of marine life than other widely used fishing methods (Kando 1989). Both Japan and Taiwan have been criticized for allowing an upsurge in the size of their drift gillnet fleets before the necessary information was available for estimating the combined MSY for the longline and expanded surface fisheries. Evidence indicates that drift gillnets may pose an additional environmental threat by incidentally catching large number of marine mammals, seabirds, and marine turtles (Wright 1989). Operators of trolling vessels fishing in the same area as drift gillnet boats have complained that gillnets, which can be up to 60 km long, create a navigational hazard in the open ocean (Anonymous 1989b). In addition, operators report that a substantial proportion of their catch shows signs of having been entangled in drift gillnets. The landed value of these "net marked" fish is lower because of their damaged condition.

International opposition to drift gillnet fishing culminated in December 1989 when the General Assembly of the United Nations passed a resolution calling for members of the world community to

suspend large-scale, pelagic, drift gillnet fishing in the South Pacific by July 1991. The proposed moratorium was presented as an interim measure until appropriate conservation and management arrangements for South Pacific albacore are established. The Government of Taiwan agreed to comply with the moratorium (Honolulu Advertiser 1990b) and has imposed various regulatory measures on its drift gill-netting fleet (FFA 1990b). Representatives of Japan's Fisheries Agency continue to argue that a ban on drift gillnet fishing is unjustified (Doi 1990). However, Japan announced it will suspend all drift gillnet fishing in the coming 1991 season (Honolulu Advertiser 1990a).

INTERNATIONAL LAW AND HIGH SEAS FISHERIES

During the past four decades three successive United Nations Conferences on the Law of the Sea have sought to develop a new set of international rules guiding the use of the oceans. The conventions emerging from the first and third of these conferences embody principles that attempt to qualify the Grotian concept of freedom of fishing on the high seas.[1] They set forth certain obligations that states have regarding the conservation and management of fishery resources occurring beyond the limits of national jurisdiction. These two conventions are discussed here.

1958 High Seas Fisheries Convention

The first Law of the Sea Conference, convened in Geneva in 1958, led to the passage of the Convention on Fishing and Conservation of the Living Resources of the High Seas (High Seas Fisheries Convention). The treaty retained the traditional right of all nations to engage in fishing on the high seas, but it placed a duty on states "to adopt, or to cooperate with other states in adopting, such measures for their respective nationals as may be necessary for the conservation of the living resources of the high seas" (article 1).

Article 6 recognizes the special interest of coastal states "in the maintenance of the productivity of the living resources" in high seas areas adjacent to their territorial seas. It also recognizes their right to participate "in any system of research and regulation for purposes of conservation of the living resources of the high seas in that area, even though its nationals do not carry on fishing there." This article also authorizes a coastal state to request states whose nationals are

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[1]The Second Law of the Sea Conference held in 1960 in Geneva was an unsuccessful attempt to reach an agreement on the precise nature of coastal states' rights in fishery resources adjacent to their coasts but beyond the territorial sea (Knight 1977).

engaged in fishing in the high seas adjacent to its territorial sea to "enter into negotiations with a view to prescribing by agreement the measures necessary for the conservation of the living resources of the high seas in that area."

Ratified by 33 nations, the 1958 High Seas Fisheries Convention was the largest international agreement concerning fisheries up to that time (Eckert 1979). However, a number of major fishing nations, including Japan, the Soviet Union, and Canada, chose not to participate in the agreement (Miles and Burke 1989). The Convention has been criticized for failing to indicate how high seas fishery resources or the benefits from harvesting these resources should be allocated among competing nations and fishermen (Heck 1975; Oda 1983). As Knight (1977:33) notes, "The allocation problem is at the crux of all high seas fishery management conflicts for it is the question of 'who gets what' from the fishery." Oda (1983:755) remarks that, as a result of the treaty's inadequacies, it "seemed unable to function properly" and "was not applied in practice--either internationally or nationally."

1982 Convention on the Law of the Sea

Perhaps the most significant outcome of 1982 United Nations Convention on the Law of the Sea (UNCLOS III) was worldwide acceptance of a 200-mile marine resource regime. Article 56 gives coastal states exclusive rights to explore, exploit, conserve, and manage the living and nonliving resources within a belt of water extending to 200 nautical miles. Nearly all nations consider highly migratory species among the living resources subject to coastal state authority in the 200-mile zone (Burke 1984).

The universal adoption of 200-mile enclosures by coastal states largely eliminated the need for international cooperation in controlling the exploitation of sedentary coastal species (Eckert 1979). Likewise, international regulation of harvests may be unnecessary in areas where the movements of migratory fish are negligible in relation to the size of the 200-mile zones (Hilborn and Sibert 1988). However, many fishery resources lie outside the boundaries of national jurisdictions or cut across existing boundaries in such a way that effective management by individual coastal states is not feasible. As one fishery scientist (Joseph 1977:282) remarked, unless there is international cooperation in managing some highly migratory species both within and beyond 200-mile zones, the coastal states "might well find themselves, as result of overfishing in mid ocean, exercising sovereign rights over 200 miles of empty water."

UNCLOS III attempted to resolve these fisheries management problems by making special provisions for fish species that do

not remain for extended periods within any single nation's coastal waters. Annex I to the 1982 Convention lists various highly migratory species, including albacore tuna. Article 64 obligates coastal states and other states whose nationals fish for highly migratory species to "cooperate directly or through an international organization with a view to ensuring conservation and promoting the optimum utilization of such species . . . both within and beyond the [200-mile zone]." With regard to fish stocks that straddle both 200-mile zones and adjacent high seas, article 63(2) requires coastal states and fishing nations to "seek, either directly or through appropriate regional or subregional organizations, to agree upon the measures necessary for the conservation for these stocks." Finally, articles 116 to 120 are devoted to high seas fishing and are largely derived from the provisions of the 1958 High Seas Fisheries Convention. They reassert the duty of states to cooperate with each other in the conservation and management of living resources in the areas of the high seas.

In contrast to the 1958 High Seas Fisheries Convention, UNCLOS III has been endorsed by most of the world community, having been signed by 159 nations and other entities (United Nations 1989). However, UNCLOS III shares many of the same inadequacies of the 1958 Convention in addressing the crucial questions facing fisheries management. The "common heritage of mankind" notion used by UNCLOS III delegates to formulate a comprehensive joint management regime for the resources of the deep seabed was not applied to the resources of the superjacent water column. UNCLOS III offers no specific guidance in structuring a collaborative fisheries management regime or apportioning the limited living resources of the high seas (Van Dyke and Heftel 1981; Oda 1983). Kent (1980:150) states that, instead of confronting these critical problems, "the fisheries articles of [UNCLOS III] put them off, offering only the bland hope that they will be addressed by negotiations among the concerned parties at some unspecified time in the future."

The fact that states are often unable to come to successful agreement by negotiation is evidenced by the growing number of fisheries disputes between DWFNs and coastal states over stocks that move between 200-mile zones and the adjacent high seas. These unresolved conflicts have created pressures on coastal states to extend their jurisdiction over fishing beyond 200 miles (Miles and Burke 1989). In a discussion of current rules of international law pertaining to the conservation of high seas fishery resources, Koh (1985:392) concludes, "[UNCLOS III] imposes an obligation to cooperate upon states that find themselves in [situations where high seas stocks are endangered by overfishing], but it is a weak obligation. Unless these groups of states are guided by their enlightened self-interests to enter into cooperative arrangements to conserve the species, we could still end up with an overexploitation of certain species."

REGIONAL COOPERATION IN FISHERIES ARRANGEMENTS

The advent of the new Law of the Sea regime completely transformed the political configuration of the Pacific Basin (Fig. 4). As the 22 island countries and territories in the region declared 200-mile exclusive economic or fishing zones, nearly 40% of the high seas area of the South Pacific was brought under national resource jurisdiction (Cicin-Sain and Knecht 1989). The combined area of these 200-mile zones exceeds 30 million km^2 (Doulman 1987a).

The various species of tuna inhabiting the South Pacific are the most important renewable marine resources in the region. By more firmly defining the jurisdictional boundaries of island states, UNCLOS III increased their control over the harvesting of the tuna resources within their respective 200-mile zones. Given the limited land-based resources of most of the Pacific island countries, commercial exploitation of tuna may be one of their few opportunities for economic development. As one commentator (Doulman 1987c:301) has noted, "To Pacific island countries, tuna is what oil is to countries of the Middle East."

Since the late 1970s, the Pacific island countries have taken joint measures to ensure that they acquire a larger portion of the benefits from the harvest of tuna stocks in the region. This regional collectivity is manifested in a series of interrelated international conventions, agreements, and treaties that have used the principles of the Law of the Sea as a point of departure. The most significant of these fisheries arrangements are described below.

South Pacific Forum Fisheries Agency Convention

In 1979, the Pacific island nations adopted a convention establishing the FFA. Membership in the FFA is limited to the politically independent island states because of a concern that an open-membership organization would be dominated by DWFNs whose fisheries interests conflict with those of the island countries (Van Dyke and Heftel 1981; Doulman 1990).[2]

Gubon (1987:253) notes that "The formation of FFA was a deliberate attempt [by the island nations] to capitalize on the rights and obligations granted them by the then-emerging Law of

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[2]The members of the FFA are Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu and, Western Samoa (Doulman 1988a).

the Sea." In particular, the countries sought to establish an organization that could assist member governments in exercising their sovereign rights over the fishery resources within their 200-mile zones in order to derive higher financial returns from the harvest of the resources. Because most of the member countries do not have the fishing capacity to harvest the resources themselves, benefits from resource exploitation are primarily in the form of fees paid by DWFNs in return for fishing access rights. For several FFA member states, revenue generated by DWFN access fee payments represents more than 50% of the national government's budget (Doulman 1990). The access fees are generally related to the market value of the fish harvested and are payable before the commencement of fishing trips (Doulman and Terawasi 1989). In addition to access fees, DWFNs frequently offer fisheries development assistance to island countries to promote more lenient access terms for DWFN fleets (Doulman 1987a). The access agreements generally do not place limitations on catch levels, but restrictions may be expressed in terms of vessel numbers and duration of the agreement (Doulman 1988b). The FFA member states have recently agreed to restrict the number of licenses issued to purse seine vessels and to reduce the current number of licenses by 20% (Doulman 1990).

By providing scientific, legal, and economic information, the FFA has been successful in helping members improve their bargaining position in negotiating bilateral and multilateral fisheries access arrangements with DWFNs. In addition, the FFA has assisted island countries in developing domestic fishing industries, marketing marine products, drafting fisheries legislation, implementing a regional fisheries surveillance program, and training fisheries personnel (Doulman 1988a).

Nauru Agreement

The parties to the Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Interest (Nauru Agreement), often referred to as the Nauru Group, are a subgroup of the FFA.[3] The 200-mile zones of the Nauru Group nations encompass the major fishing grounds of DWFN fleets operating in the region (Doulman 1987c). Concluded in 1981, the Nauru Agreement obligates cooperating island countries to set certain terms and conditions in granting access to foreign fishing vessels, thereby preventing competitive undercutting. The minimum terms and conditions involve vessel licensing, uniform vessel identification, catch and position reporting, catch and effort logbooks, placement of on-board observers, and stowage of fishing gear (Terawasi 1988). By forestalling attempts by DWFNs to play

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[3]The signatories to the Nauru Agreement are Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, and Solomon Islands (Doulman 1987b).

island countries against one another, the set of nonnegotiable terms and conditions greatly increased the bargaining power of the island countries in negotiating fisheries agreements. This strategy has since been adopted by all FFA member states (Doulman 1989).

The Nauru Group was also instrumental in developing the Regional Register of Fishing Vessels, an international licensing system for all foreign fishing vessels operating in the 200-mile zones of FFA member countries (Doulman and Terawasi 1989). A vessel that has been accorded the status of "good standing" on the Register is allowed to fish in the 200-mile zone of any FFA member country as long it complies with national fisheries laws and access agreements. If a vessel fails to submit to the jurisdiction of any participating nation, it may be excluded from the zones of all FFA member nations. In July 1989, the Register, which is maintained by the FFA, had 2,260 vessels listed from 22 countries.

The initial apprehension by DWFNs that the Nauru Agreement would result in excessive access fees and discriminatory vessel licensing practices has proven unwarranted (Doulman 1987b). The island states recognize that it is in their best interest to develop access arrangements acceptable to DWFNs. As Doulman (1987b:265) so succinctly put it, the island countries are "acutely aware that by cooperating they could pluck the DWFN goose but they must not kill it in the process."

Treaty on Fisheries Between Pacific Island States and the United States

The United States has long argued that tuna, being highly migratory, can be effectively managed only through international arrangements (Van Dyke and Nicol 1987). This position led to domestic legislation in the 1970s that rejects the authority of coastal states to establish exclusive rights over tuna within their 200-mile zones. By sanctioning attempts of the U.S. fishing fleet to harvest tuna within the zones of Pacific island countries without paying access fees, U.S. policy instigated a "tuna war" in the region that severely strained political relations between the United States and the island nations (Tsamenyi 1986).

However, in 1987 the United States capitulated due, in part, to the growing political presence of the Soviet Union in the Pacific island region (Gardner 1988). In that year, the United States signed the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United

States (Treaty on Fisheries) with 15 FFA member nations.[4] Although the treaty does not explicitly recognize coastal state jurisdiction over tuna, the United States agreed that U.S. purse seine vessels are required to adhere to certain terms and conditions in order to fish in the region (Wolf 1989).[5] The principal issues of the treaty are licensing and the Regional Register of Fishing Vessels, closed and limited areas, catch reporting, and licensing fees (Van Dyke and Nicol 1987).

The access fee of $60 million that the United States agreed to pay over 5 years is equal to about 10% of the landed value of the fish likely to be caught (Swan 1989). In return, the U.S. purse seine fleet gained secure access to 26 million km^2 of ocean without having to purchase licenses from individual nations. The treaty area includes the 200-mile zones of the FFA member countries and the high seas areas adjacent to the zones.

Driftnet Fishing Convention

In November 1989, representatives of the Pacific island countries and territories, France, Britain, and various regional organizations met to develop and endorse the Convention to Prohibit Driftnet Fishing in the South Pacific (Driftnet Fishing Convention) (Wright 1989). In a later meeting that month, Japan, South Korea, the United States, and the Taiwanese Tuna Boat Owners and Exporters Association were invited to associate with the Driftnet Fishing Convention through its protocols.[6] The

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[4]All FFA member states except Tonga have signed and ratified the Treaty on Fisheries (Doulman 1989a).

[5]The U.S. purse seine vessels usually target skipjack tuna, *Katsuwonus pelamis*, and yellowfin tuna, *Thunnus albacares*, tuna. The U.S. trollers fishing for albacore tuna outside of the 200-mile zones of FFA member states are exempted from the provisions of the Treaty on Fisheries.

[6]The Driftnet Fishing Convention is open for signature by any member of the FFA, the metropolitan state of any territory situated within the convention area, and any territory within the convention area that has been authorized by the metropolitan government to sign. In addition, two protocols are being drafted to enable states whose nationals fish within the convention area and other countries of the Pacific Basin to enter into the agreement. As of January 1991, the Convention has been signed by Australia, Cook Islands, Federated States of Micronesia, France, Kiribati, Marshall Islands, Nauru, New Zealand, Niue, Palau, Tokelau, Tuvalu, the United States, and Vanuatu (P. Ridings, Legal Division, New Zealand Ministry of External Relations and Trade, pers. commun., January 1991). A number of FFA member

agreement prohibits drift gillnet fishing in the convention area, defined as all waters within 10°N and 50°S latitude and 130°E and 120°W longitude (Fig. 5).

In addition to focusing on the drift gillnet issue, the treaty requires parties to the Driftnet Fishing Convention and its protocols to cooperate with each other in the development of conservation and management measures for albacore in the vicinity of the convention area. Pursuant to this mandate, negotiations to develop a regime for the management of albacore tuna in the South Pacific have been initiated.[7] Although the functional scope, areal domain, and membership of the proposed management regime have yet to be determined, a number of broad principles for the regime have been outlined (FFA 1989). To be effective, the regime presumably must include joint arrangements for studying and monitoring the resource, establishing harvest levels, apportioning the available catch and revenues therefrom, and enforcing management regulations. And it must be consistently implemented throughout the entire migratory range of the South Pacific albacore stock. These are formidable conditions given the large number of states with interests in the resource, the difficulty of devising workable coordinated strategies at the international level, and the immense area over which the albacore resource is distributed.

PROSPECTS FOR AN INTERNATIONAL ALBACORE FISHERIES MANAGEMENT REGIME

Given the history of fisheries relations in the South Pacific among island countries and DWFNs, what are the prospects for international cooperation in the development of an effective

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states are unwilling to allow Taiwan to participate in the treaty because of its political status (Doulman 1990). However, state officials from Taiwan were permitted to participate in the third round of discussions on arrangements for South Pacific albacore fisheries management (FFA 1990d).

[7]To date, representatives from the Pacific island states, DWFNs and regional organizations have met three times to discuss management arrangements for South Pacific albacore. The first meeting was in Wellington, New Zealand (November 1989); the second, Honiara, Solomon Islands (March 1990); and the third, Noumea, New Caledonia (October 1990). The last consultation included representatives from American Samoa, Australia, Canada, China-Taiwan, Cook Islands, Federated States of Micronesia, Fiji, France (represented by French Polynesia), New Caledonia and Wallis and Futuna, Japan, Kiribati, New Zealand, Niue, Palau, Papua New Guinea, Republic of Korea, Solomon Islands, Tonga, Tuvalu, United States, Vanuatu and Western Samoa, FFA, and South Pacific Commission (FFA 1990d).

fisheries management regime for South Pacific albacore? To help answer this question, one can turn to conceptual models used to derive hypotheses about the conditions conducive for the emergence of cooperative strategies at the international level.

Of particular interest for this study is a model developed by Young (1989) to analyze the formation of international arrangements for managing natural resources and the environment. The model, which Young (1989) calls institutional bargaining, assumes that each of the participants in international negotiations acts in the self-interest of his nation and that the negotiations are governed by unanimity rules. Young (1989) derives from the model six conditions that affect the likelihood of success in efforts to negotiate international regimes. In this section, each of these conditions is outlined and then discussed in terms of the features of existing regional fisheries arrangements which may further efforts to negotiate an effective South Pacific albacore fisheries management regime.

(1) Institutional bargaining can succeed only when the issues at stake lend themselves to contractarian interactions.

Brennan and Buchanan (1985:25) define a contractarian interaction as one in which individuals "join together to explore and ultimately to agree on the establishment of collective entities or arrangements that prove mutually beneficial." However, as Walton and McKersie (1965) have observed, efforts to negotiate the terms of these arrangements may fail if each individual focuses on maximizing his own share in the context of fixed-sum payoffs instead of searching for ways to increase the size of the joint gain without respect to the division of the payoffs.

Young (1989) maintains that the threat of negotiations ending in positional deadlock is mitigated when individuals cannot predict accurately how complex institutional arrangements will affect their particular welfare over the long run. This "veil of uncertainty," discussed in detail by Brennan and Buchanan (1985:30), leads self-interested individuals "to concentrate on choice options that eliminate or minimize prospects for potentially disastrous results" and to "tend to agree on arrangements that might be called 'fair' in the sense that patterns of outcomes generated under such arrangements will be broadly acceptable."

It is difficult to present the problem of managing the South Pacific albacore resource in contractarian terms because national interests diverge so sharply. Undoubtedly, all of the parties involved want to maintain the ultimate biological and economic viability of the resource, but there are inherent conflicts as to how the benefits and costs of an albacore fisheries management regime should be distributed. The controversy over access to

fishing grounds in the region has been summarized by President Tabai (1987:v) of the Republic of Kiribati: "[The DWFNs] naturally want to pay as little as possible, whereas the [island nations] want the very opposite." The island states would be understandably reluctant to participate in a fisheries management regime that could potentially weaken their newly acquired regulatory authority over tuna resources within their respective 200-mile zones. Moreover, it is in the interest of the island states to gain as much control as possible over tuna harvests in high seas areas, since large catches by DWFNs in these areas will have a negative impact on the abundance of tuna within the 200-mile zones.

Despite these difficulties, terms established in previous fishery agreements in the region may provide an incentive for island countries to engage in negotiations to develop a management regime. As noted earlier, these agreements often include various forms of fisheries aid as part of the price for access for DWFNs. Pacific island countries have generally resisted linking access and aid because the aid is often inappropriate and, in some cases, constitutes little more than a public relations exercise on the part of the DWFN supplying it (Doulman 1987a). However, including certain types of development assistance (e.g., favorable trade arrangements) as a possible term for granting fishing access may help expand the scope of negotiations to cover such island state concerns as employment generation and foreign exchange earnings. Young (1989:365) remarks that "linking together disparate issues sometimes opens up possibilities for mutually acceptable arrangements by creating opportunities for the international equivalent of logrolling and the formulation of package deals."

There is also potential for integration among island states and DWFNs in addressing the scientific aspects of albacore management. Already there has been considerable cooperation among fishery biologists in island states and DWFNs in assessing the albacore stock and estimating the MSY. The workshops conducted by the SPAR group have provided opportunities for defining the common problem and developing collaborative management strategies. Focusing, at least initially, on these issues leads participants to think in terms of the joint, rather than individual, gains from managing the resource.

(2) The availability of arrangements that all participants can accept as equitable (rather than efficient) is necessary for institutional bargaining to succeed.

Young (1989) argues that attempts to negotiate international arrangements generally revolve around considerations of equity rather than economic efficiency. To achieve acceptance among participants, it is essential that an international regime satisfy the principle equity demands of all participants.

In negotiating fisheries agreements, island states in the region have been concerned less with possible resource rent dissipation through excessive catch and effort than with ensuring that they receive a fair share of whatever rents are generated. The question of how resource rents are distributed overlaps with the issues discussed above and is a fundamental concern of any management regime. Even though the benefits island states derive from an albacore management regime may be greater than the gain they could reach without a regime, they may be unwilling to participate if the benefits obtained by DWFNs seem disproportionately large. The island states recognize that access fees are low compared with the benefits that might be realized by harvesting, processing, and marketing the tuna resources themselves. The DWFNs have been successful in negotiating access agreements by offering island states technical and economic assistance to expand their harvesting and processing capacity.

(3) The existence of salient solutions (or focal points describable in simple terms) increases the probability of success in institutional bargaining.

It is difficult, Young (1989) states, to negotiate and implement international regimes that require an elaborate administrative apparatus. The importance of developing salient solutions may preclude more complex institutional arrangements that appeal to those with specific equity or efficiency interests.

An example of a salient solution is the arrangement agreed upon in the multilateral Treaty on Fisheries whereby the U.S. purse seine fleet acquired access to the region after paying a common licensing fee. This arrangement permits the purse seine vessels to pursue highly migratory fish without concern for national boundaries.

A second example of a simple, yet effective solution is the system devised by the participating island states to distribute the access fees paid by the United States. The island states agreed on a 15/85 formula: 15% of the fees are divided equally among the island parties, and the remainder is distributed in proportion to the quantity of fish caught in each state's 200-mile zone (Swan 1989). A potential complication in administering this scheme is the uncertain delimitation of marine boundaries in the Pacific region. Swan (1989) describes the system of Provisional Treaty Lines (PTLs) which the island nations have agreed to implement for the purposes of the treaty. The PTLs demark the 200-mile zone of each of the FFA member countries. Swan (1989:11) states that implementation of the PTLs "reflects a strong will to arrive at an equitable solution and avoid potentially lengthy and complicated proceedings which could affect otherwise friendly relations between countries."

(4) The probability of success in institutional bargaining rises when clear-cut and effective compliance mechanisms are available.

According to Young (1989), international regime formation is more likely when the costs of verifying and enforcing the rights and rules set forth in the regime are not unduly high.

Most island countries cannot afford elaborate fisheries surveillance and monitoring programs (Doulman and Terawasi 1989). The Regional Register of Fishing Vessels maintained by the FFA is an example of a regional compliance mechanism that serves as a cost-effective alternative. Van Dyke and Nicol (1987:118) note that the consequences of a vessel being blacklisted by the FFA "are so grave that, even though the chances of getting caught are slight, the Regional Register tends to be a self-enforcing mechanism."

An equally important step toward ensuring compliance of regional fishery agreements was the willingness of the United States in the 1987 Treaty on Fisheries to accept responsibility for ensuring that U.S. vessels and operators comply with the terms of the treaty and island state fishing laws. Under the current arrangement, the U.S. Government will take judicial or administrative measures against suspected violators and confer the amount of the fine or penalty to the appropriate Pacific island nation (Swan 1989). This arrangement has helped dispel the atmosphere of conflict and distrust between the United States and the FFA member nations caused by the past refusal of the United States to recognize the jurisdiction of the island countries over the tuna resources within their 200-mile zones.

(5) For the most part, exogenous shocks or crises increase the probability of success in efforts to negotiate the terms of international regimes.

Young (1989) contends that an exogenous shock, such as a crisis which places life and livelihood at immediate risk, may compel negotiating parties to reach agreement on the terms of institutional arrangements.

Reports by the press of large catches and environmental side effects of drift gillnet operations have created a distinctive air of crisis in the South Pacific albacore fishery. Although disagreement exists among fishery scientists on the condition of the albacore stock, political representatives of many Pacific island states and a number of interested DWFNs have intimated in public pronouncements that the stock is rapidly being depleted. The general state of alarm has precipitated a widespread call for measures to regulate the harvest of albacore. Doulman (1989:27) notes that the initial refusal by Taiwan and Japan to cooperate with countries in the region by curtailing their drift gillnet operations until an albacore management regime was in place

elevated the "crisis in the southern driftnet fishery" from a fisheries problem to "a major political issue."

The recent reduction in effort and catch of the surface fishery and the expressed willingness of Japan and Taiwan to abide by the terms of the United Nations General Assembly resolution on drift gillnet fishing have considerably reduced fears of long-term damage to the South Pacific albacore stock (FFA 1990a). These developments have undoubtedly lessened the perceived urgency of establishing a management regime, but there are still important reasons for the negotiations to continue. For example, the drift gillnet issue continues to be a point of contention. Japan, Taiwan and South Korea have not ruled out the possibility that drift gill-netting may be consistent with effective management of albacore if properly regulated, while most Pacific island states view the permanent cessation of pelagic drift gill-netting in the region as a nonnegotiable item of any management arrangement. In addition, even though the risk of depleting the albacore stock has diminished, interest is growing among Pacific island nations in implementing an international management scheme for stocks of other highly migratory species, particularly those targeted by the purse seine fleets of DWFNs (Doulman 1990). These countries view an albacore fisheries management regime as the initial step toward a comprehensive management policy for all international fisheries in the region.

(6) Institutional bargaining is likely to succeed when effective leadership emerges; it will fail in the absence of such leadership.

Finally, Young (1989) emphasizes that it is important that a governmental or nongovernmental entity assumes an entrepreneurial role in developing and soliciting support for institutional options.

One of the prime facilitators of multilateral and bilateral fishery negotiations in the Pacific island region has been the FFA. During the past decade, the FFA has repeatedly demonstrated its expertise in helping put together deals or packages of provisions that offer enough attractions to all parties to induce their support. Perhaps the best example of the FFA's leadership abilities is the successful negotiation of the innovative Treaty on Fisheries. As Swan (1989:16) comments, "The Treaty breaks new ground in international law in many respects, and is the most comprehensive fisheries access agreement in the region, and perhaps the world."

The SPAR group has taken the lead in providing accurate and impartial information on the magnitude, distribution and dynamics of albacore, the first step in the management of any fishery resource (Kearney 1978). Scott (1980:93) remarks, "nothing can

take the countries beyond stage one until the technicians have agreed on their interpretation of the [scientific] dimensions of the common problem, and have transmitted this common understanding, unanimously, to those who plan international action." Although the uncertainty about the status of the South Pacific albacore resource is still considerable, SPAR has played a key role in establishing an effective international forum for exchanging and analyzing information.

CONCLUSION

The Law of the Sea obligates nations to cooperate on joint conservation and management measures to protect the fishery resources of the high seas from overexploitation. However, this set of international rules provides no assurance that parties will reach agreement as to how the resources should be managed. In this paper, a model of international regime formation developed by Young (1989) was used to explore the likelihood that concerned states will be successful in forming international arrangements to manage the albacore tuna inhabiting the high seas and coastal areas of the South Pacific. Information on the condition of the South Pacific albacore stock is limited, but many scientists knowledgeable about the biology and behavior of the species have expressed concern over recent harvest levels of juvenile albacore and the impact on the stock. In particular, there is apprehension that the uncontrolled and rapid expansion of drift gillnet operations may reduce the catch rates of the longline fleet and threaten the long-term economic and biological viability of the resource. These concerns have led to a general call for an international management plan for South Pacific albacore. Both Japan and Taiwan have agreed to suspend their drift gillnet operations in the South Pacific until a plan has been developed.

A number of problems were identified that may frustrate current efforts by the Pacific island states and DWFNs to establish a South Pacific albacore fisheries management regime. As mentioned above, there is a shortage of scientific data for making appropriate management decisions. Even if management decisions were reached, they might be difficult to enforce because of the wide-ranging migratory patterns of albacore. There is also the question of how the benefits and costs of an international management regime are to be distributed among participants. The island states are likely to perceive the costs of relinquishing some degree of regulatory authority over the albacore resource within their 200-mile zones to be high. It is almost certain they will demand some form of compensation from DWFNs.

Terms of previous bilateral and multilateral fishery arrangements in the region will help mitigate these problems. The fishing vessel licensing system administered by the FFA has

proven to be an effective compliance mechanism. Stipulations regarding catch recording and reporting also make the licensing system an important source of information on trends in the harvest and fishing effort of DWFN vessels. As these data are compiled and analyzed by the SPAR group and other fisheries research entities in the region, the scientific basis for management decisions will be improved. The distributional question is a particularly thorny one, but here again, previous fisheries treaties in the region prove instructive by demonstrating how side payments of development aid can be used to increase the overall net benefits that accrue to the island countries.

Although a number of important factors work in favor of the establishment of an effective South Pacific albacore fisheries management regime, it is still very difficult to forecast the final outcome of the present negotiations. The models of Young (1989) and others provide considerable insight into the conditions under which international regime formation is likely or unlikely to occur, but their predictive power is still limited because of the complexity of international relations. Additional empirical research will help refine these models. What is certain is the eventual need for international cooperation if the depletion of the albacore and other high seas fisheries resources of the South Pacific is to be avoided.

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Table 1.--Catch of South Pacific albacore tuna by country and gear, 1980-90. (Adapted from South Pacific Forum Fisheries Agency (1990c).)

Year	Catch by country and gear[a]							
	Austra-lia	Japan	Korea	New Zealand	Taiwan	U.S.	Other	Total
				Total Fishery Catch				
1980	200	2,488	10,852	1,468	18,180	0	19	33,207
1981	200	4,856	14,793	2,085	14,595	0	8	36,537
1982	200	4,900	12,586	2,434	12,689	0	96	32,905
1983	200	4,960	6,669	744	12,119	0	127	24,819
1984	100	5,188	5,730	2,773	11,155	0	152	25,098
1985	100	5,674	14,267	3,253	9,601	0	253	33,148
1986	146	6,402	18,799	1,911	11,913	89	415	39,669
1987	300	5,004	8,646	1,227	15,009	748	830	31,764
1988	300	11,165	6,896	330	18,120	3,527	797	41,135
1989	690	18,363	9,184	5,202	25,000	3,810	796	63,045
				Surface Fishery Catch				
	Pole and line	Gill-net	Gill-net	Troll	Gill-net	Troll	Other	Total
1980	200			1,468			19	1,687
1981	200			2,085			8	2,293
1982	200			2,434			1	2,635
1983	200	32		744			2	978
1984	100	1,581		2,773				4,454
1985	100	1,928		3,253				5,281
1986	100	1,936		1,911		89		4,036
1987	100	919		1,227		748		2,994
1988	100	4,271		330	1,000	3,527		9,228
1989	100	13,263	184	5,202	11,000	3,810		33,559
1990	100	5,567		3,341	2,000	4,637		15,645

Table 1.--Continued.

Year	Catch by country and gear[a]							
	Austra-lia	Japan	Korea	New Zealand	Taiwan	U.S.	Other	Total
				Longline Fishery Catch				
1980		2,488	10,852		18,180			31,520
1981		4,856	14,793		14,595			34,244
1982		4,900	12,586		12,689		95	30,270
1983		4,928	6,669		12,119		125	23,841
1984		3,607	5,730		11,155		152	20,644
1985		3,746	14,267		9,601		253	27,867
1986	40	4,466	18,799		11,913		415	35,633
1987	200	4,085	8,646		15,009		830	28,770
1988	200	6,894	6,896		17,120		797	3,1907
1989	590	5,100	9,000		14,000		796	29,486

[a]Data for 1990 are incomplete.

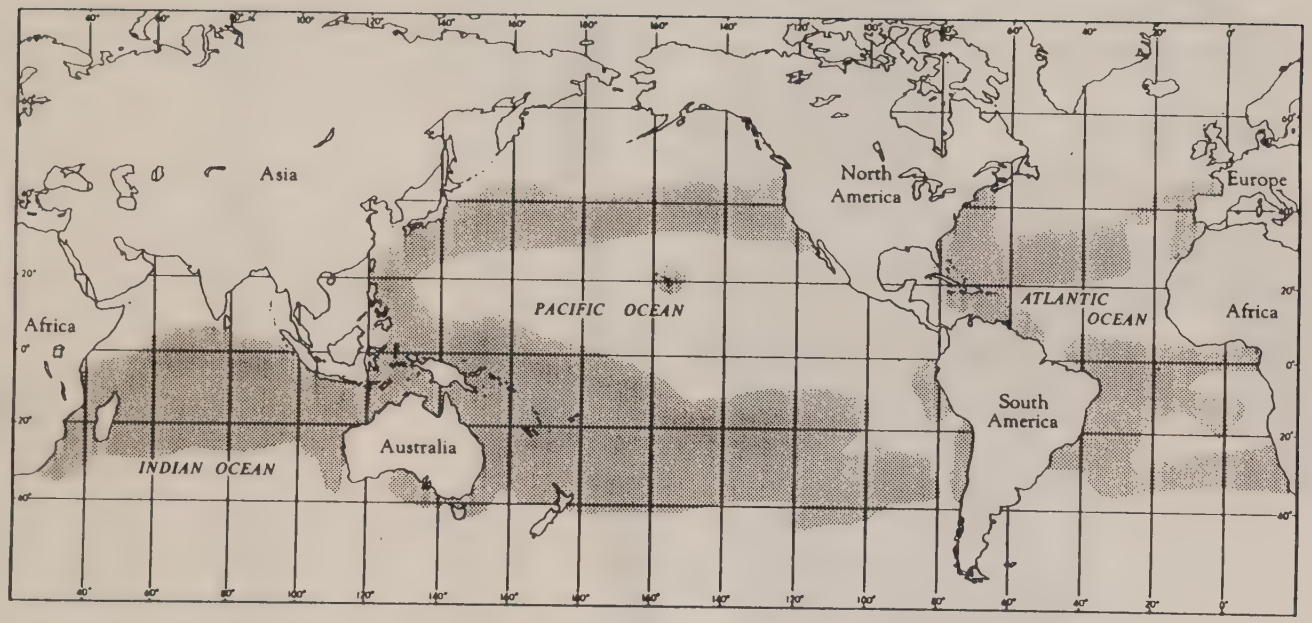

Figure 1.--Estimated distribution of albacore (from Saila and Norton (1974)).

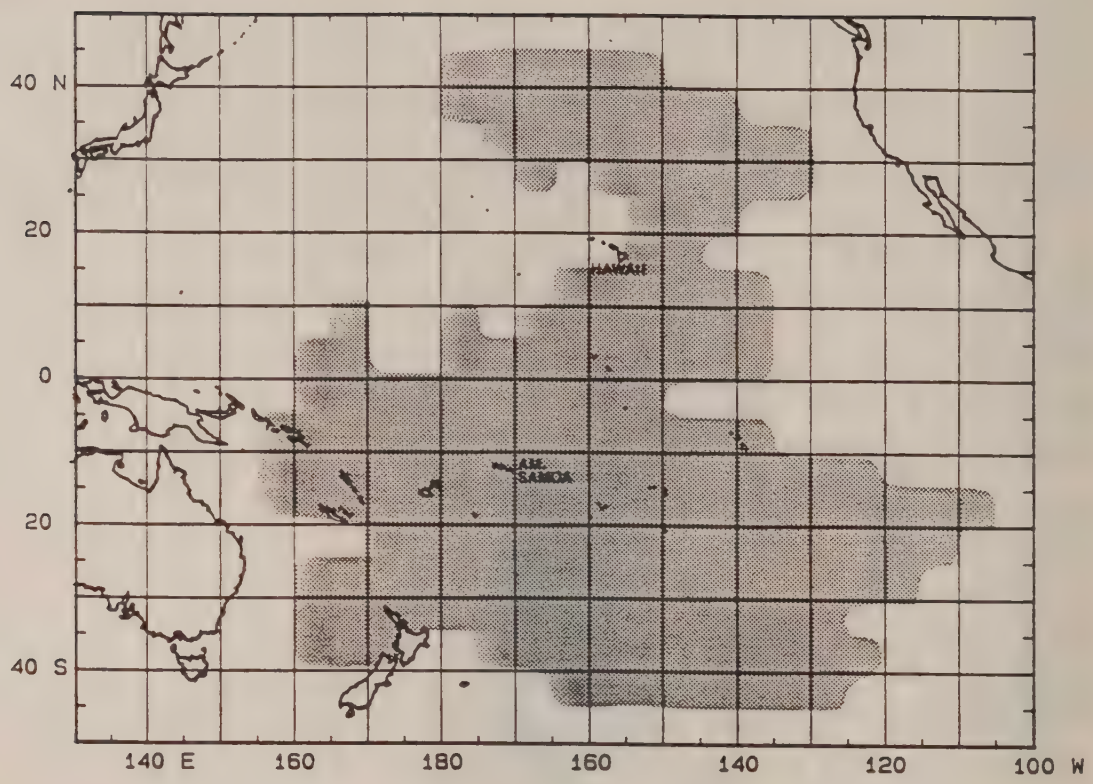

Figure 2.--Area fished by longline vessels harvesting albacore in the Pacific (from Ito and Yamasaki (1988)).

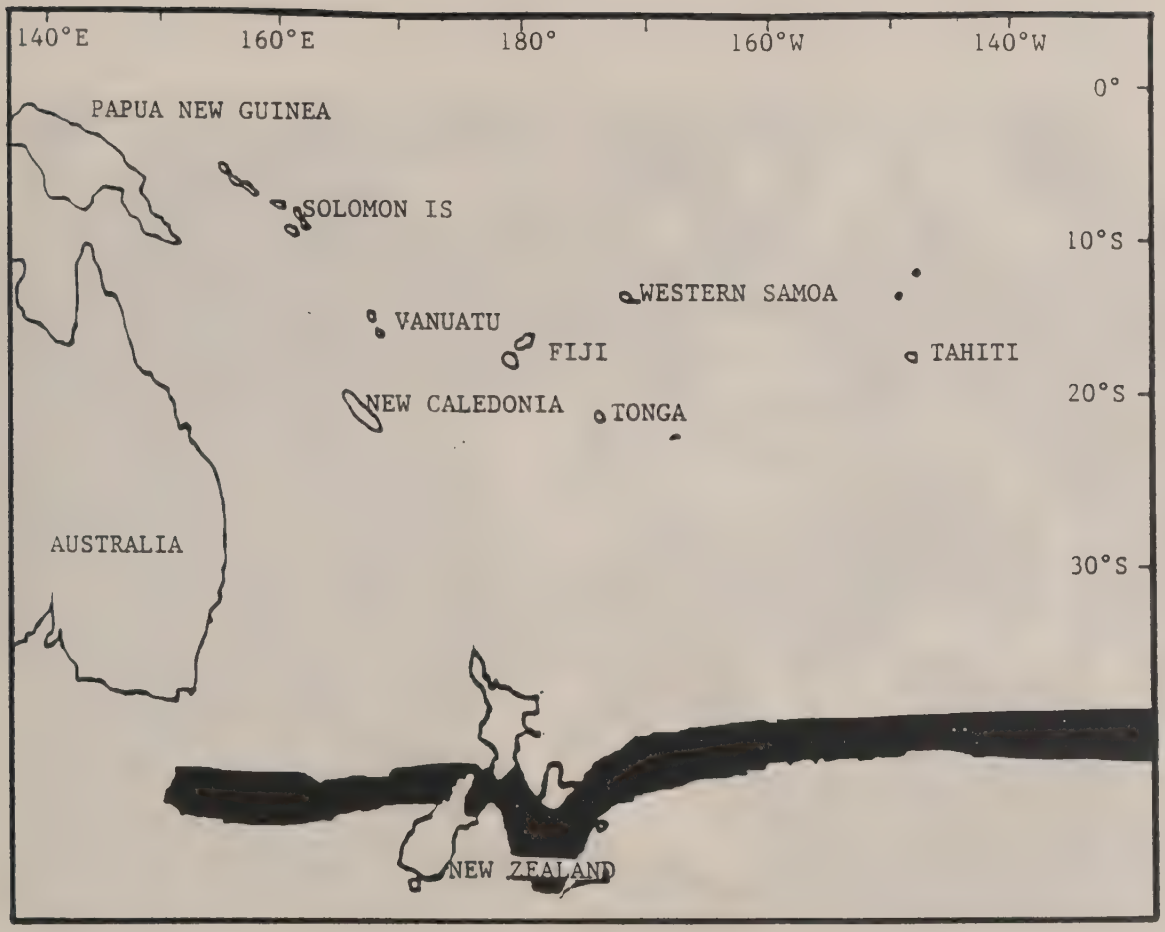

Figure 3.--Area fished by trolling and drift gillnet vessels harvesting albacore in the South Pacific.

Figure 4.--The 200-mile zones of the island states of the Pacific (from Cicin-Sain and Knecht 1989).

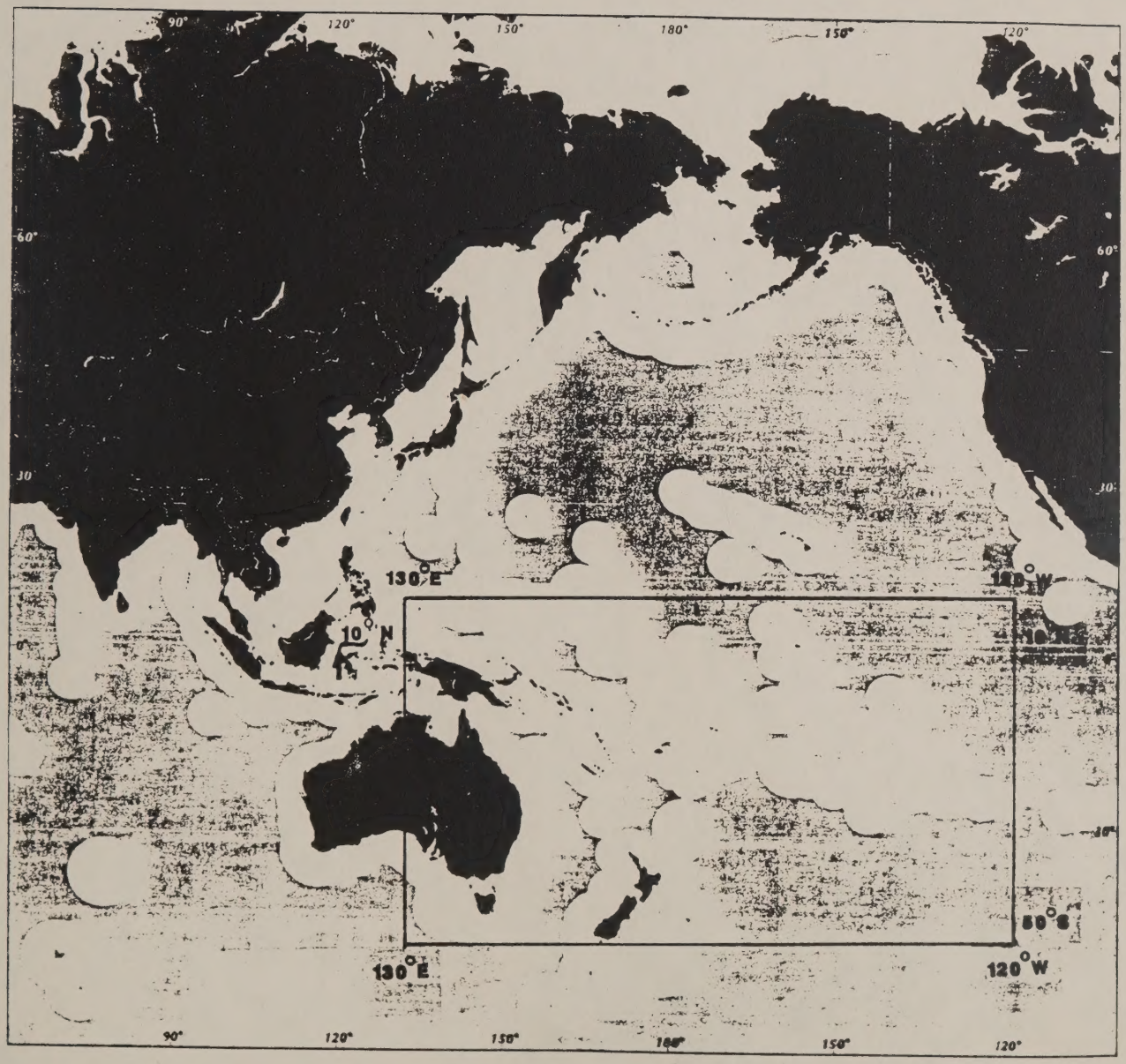

Figure 5.--Area of 1989 Convention to Prohibit Driftnet Fishing in the South Pacific (adapted from Cicin-Sain and Knecht 1989).